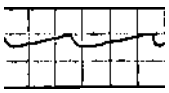
to the cool gas or air passing to the regenerators, it soon warps and becomes leaky. These leaks permit air to pass directly to the stack and cool down the waste gases; or, if the valve is used for gas, there is continual leakage of gas, which burns either in the valve or in the stack flue.

While many reversing valves are water-scaled, most of them, like the butterfly valve, during the* operation of the valve, open a direct connection, practically the full area of the valve from gas main or air to the stack. Then* have been a few valves which cut the furnace, gas and air entirely off from one another and the stack, but these valves have not come into extended use.

Water-sealed valves are used extensively. As long as the seal



FKJ. 15H.

FHJ. 159.

FH»S. 15H arul 159, -Pyrometer Diagrams of Stack Temperature's, Abnormal conditions shown by suddctn upward kick in Fig. 159 jiro probably dun to nir ioukiiKft mid the combustion of chcjokdr ^RHC^H passing along the **fhio** to the* Black,

holds they are tight, but there are usually structural limitations to the? depth of the seal When exposed to gas pressure; on one side and to the stack depression on the other, the seal is unbalanced and may readily be* broken by surges or explosions. In Home eases, a considerable! water area is exposed to the entering gas or air, as well as to the waste gases.

The producer gas and the stack gases are several hundred degrees hotter than boiling water and will absorb a considerable amount of moisture from a very small area of water surface. Other valves expose very little water

surface. With nil of those* vulvas the sealing lip must bo raised to clear the water surface and the port rims, whenever the valve in operated. From the